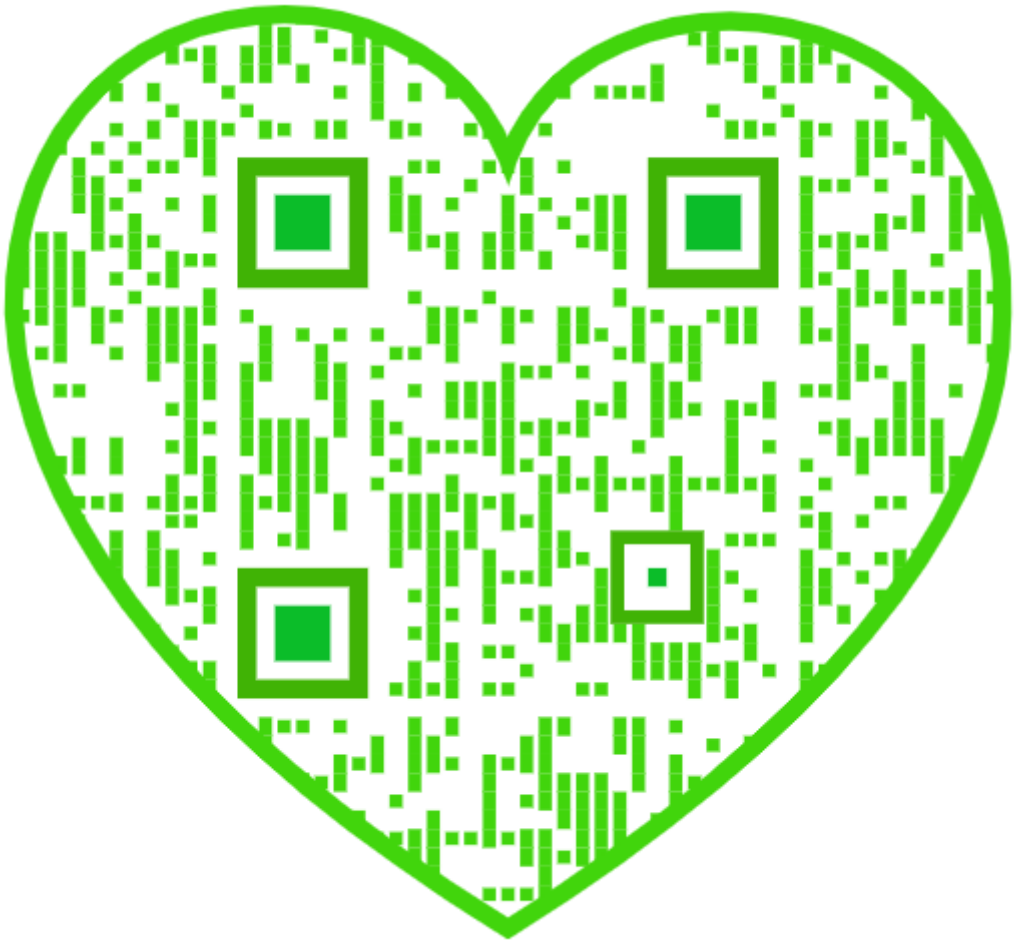
Master in Artificial Intelligence

Algorithm Selection & Development XIII



Purpose

The purpose of the section is to help you learn how to research, select, and develop appropriate algorithms to become a Successful Artificial Intelligence (AI) Engineer

At the end of this lecture, you will learn the following

- **How to use techniques like regularization, dropout, batch normalization, and learning rate scheduling to improve model generalization and performance**

Iterative Development and Optimization

Iterative Development and Optimization

- Iterate on the model development process by fine-tuning hyperparameters, experimenting with different architectures, and incorporating domain knowledge.
- Use techniques like regularization, dropout, batch normalization, and learning rate scheduling to improve model generalization and performance.
- Monitor and analyze model training/validation metrics to diagnose issues and make adjustments accordingly

How to use these techniques to improve model generalization and performance

Regularization

Dropout

Batch normalization

Learning rate scheduling

How to use Dropout to improve model generalization and performance

Regularization

Dropout

Batch normalization

Learning rate scheduling

How to use Dropout to improve model generalization and performance

Add Dropout Layers

↓

Train with Dropout

↓

Test without Dropout

↓

Regularize the Model

How to use Dropout to improve model generalization and performance

Experiment with Dropout Rate

Combine with Other Regularization Techniques

Monitor Performance

How to use Batch Normalization to improve model generalization and performance

Regularization

Dropout

Batch normalization

Learning rate scheduling

How to use Batch Normalization to improve model generalization and performance

Insert Batch Normalization Layers

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Train with Batch Normalization

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Test without Batch Normalization

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Regularize the Model

How to use Batch Normalization to improve model generalization and performance

Experiment with Hyperparameters

Combine with Other Regularization Techniques

Monitor Performance

How to use Learning rate scheduling to improve model generalization and performance

Regularization

Dropout

Batch normalization

Learning rate scheduling

How to use Learning rate scheduling to improve model generalization and performance

Choose Learning Rate Schedule

↓

Implement Learning Rate Schedule

↓

Monitor Model Performance

↓

Adjust Learning Rate

How to use Learning rate scheduling to improve model generalization and performance

Experiment with Schedule Parameters

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Use Adaptive Schedules

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Monitor Convergence

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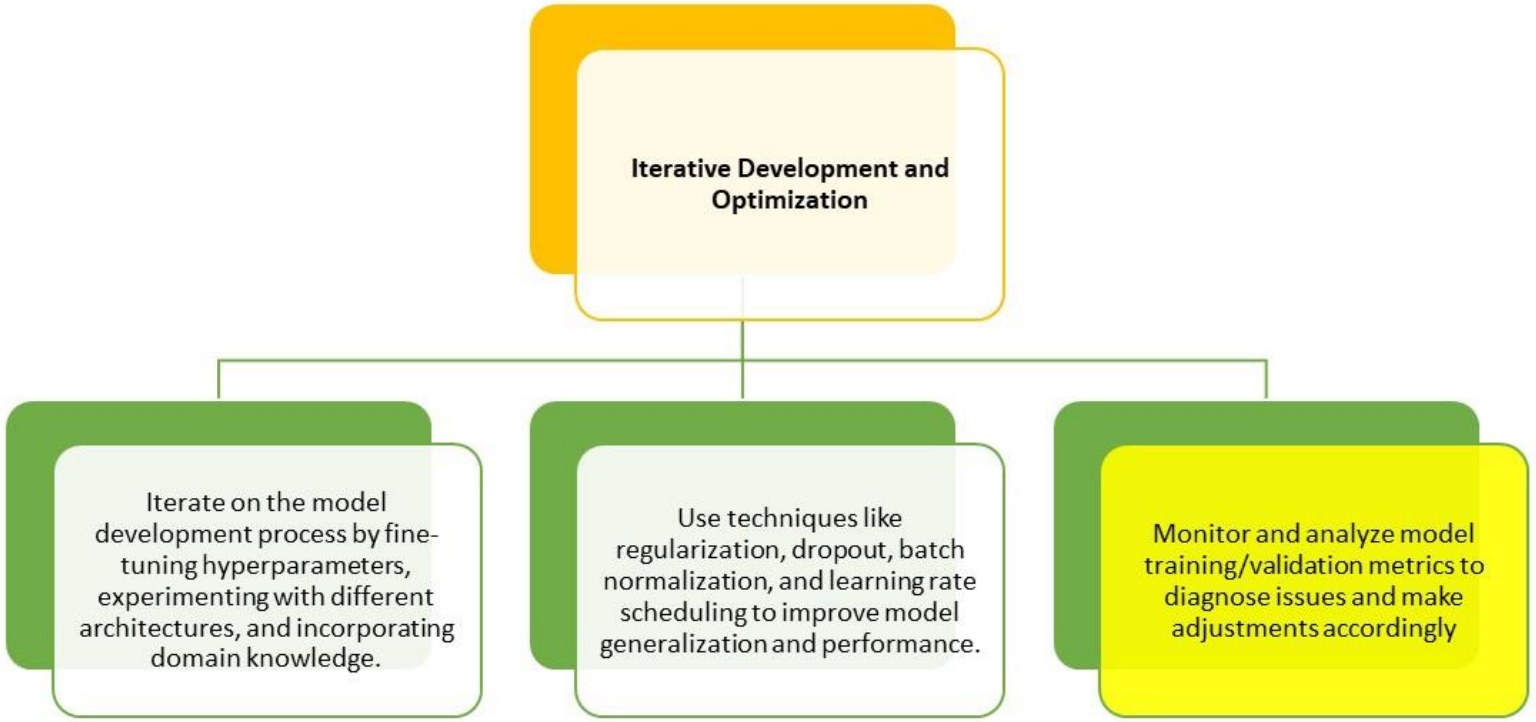
Validate on Holdout Set

What is next?

And last step of iterative development and optimization



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